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PLANNING ACTIONS OF NEW SERVICE TECHNOLOGY CREATING

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Abstract. Many business companies attempt to create new service and make use of new technologies in order to better satisfy customers' needs. Regrettably, realization of these actions is often wrongly planned; systematically unsubstantiated, so unproductive expenditure does not produce the expected result. On summarizing the information presented in a wide spectrum of scientific and special literature and after assessing it from the perspective of logical adaptability and systemic approach, a procedural model of new service technology planning is presented. The model consists of the following key components: assessment of the market demand, selection of appropriate resources, choice of suitable procedures, planning of quality and standardization of procedures. The article discusses the content of the components and their sequence. Application of the suggested model will allow businesses to be consistent in technology planning of new service and increase the likelihood of their success.

Keywords: techmology planning, model, service business, new service development, procedure creating.

JEL classification: O31.

1. Introduction

Even in 1942 creator of innovations theory Shumpeter in the Journal "Capitalism, Socialism and democracy" states, that competition challenges to win only that business, which develops new products and services, introduces customers with a new technologies, is looking for new sources and apply new organizational methods. Thus it can be argued that all novelty has to be more improved, with superior characteristics of quality, more profitable (R.R. Nelson, K. Nelson 2002). It is understandable, that appropriate technologies of new service also have to be more popular, better valued of customers and more profitable for the company. Consequently modernization or creation of new technologies means developing them more energy saving, less handwork intensive, more efficient, which allows to provide more modern services (Drejeris *et al*. 2013). Business companies must not only monitor service technology development trends in the world, but also to look for new opportunities to create a products technologies independently and to check again and again whether the company's proposed products still meets the users needs and to provide for future development prospects (Palo, Tahtinen 2011).

In the conditions of market economy it is necessary to look for ways to improve competitive advantage; it means to improve a company's range of options to better meet the needs of users. Many business companies are trying to create new services, use of new technologies, but these actions will often not properly planned, systematically unfounded, therefore requires a inadequate multiple inputs and do not achieve an expected results, innovations often fail. These circumstances are identified as a problem of the article. The object of research is the process of creation new service technology. Aim of the article is to provide a reasonable, universal methodology of new service technology planning, which would be appropriate to follow business enterprises of various activities and different size.

In order to achieve this aim need to solve these tasks:

1) To analyze scientific literature on the attitudes of new production technologies;
2) Critically evaluate new products technology feasibility aspect and according rational solutions suggest procedural model of new service technology planning;
3) Discuss the steps and content of the functional components of the proposed model.

2. Discussion on new service technology planning course

With a view to identify the sequence of technology planning stages, it is appropriate to accept some researchers (Trot 2005; Palo, Tahtinen 2011) claim; that during determination components of

planning innovation technology, need to know the final characteristics and the possible limitations (financial, labour, material, time). Appropriate example for new service technology planning can be food technology planning, which is investigated a little more. V. A. Zeithaml and M. J. Bitner (2005) even emphasized, that offering of new dish in the catering company can be approached as a new service. After carefully examination of the production processes technology can be seen that technological project (plan) includes not only the process of documentation preparing, but acquisitions of necessary technological equipment also, and acceptance other decisions related to costs optimization (Drejeris 2011). It can be recognized that any specifics description of new service technology creating does not have major contradictions to the mentioned technologies project (plan). J. M. Aguileira (2009) largely does not preclude such characterization of technology, but even more detail explains, that technology is tool of human, materials and information resources conversion into products. Therefore, it can be argued that planning of new products technology means determination procedures of manufacturing processes then submission, creation of production making other elements and conformation of their sequence.

G. J. Avlonitis and P. Papastathopoulou (2006) emphasizes that planning of new products and services is the longest time in terms of the innovation process usually requires the most resources, so it is even particularly responsible.

C. Boshoff (1997) and E. Venter *et al.* (2005) discern the stage of responsibility division and claim of necessity these components of service technology planning:

1) Determination of end-service performance (result), which would satisfy consumers;

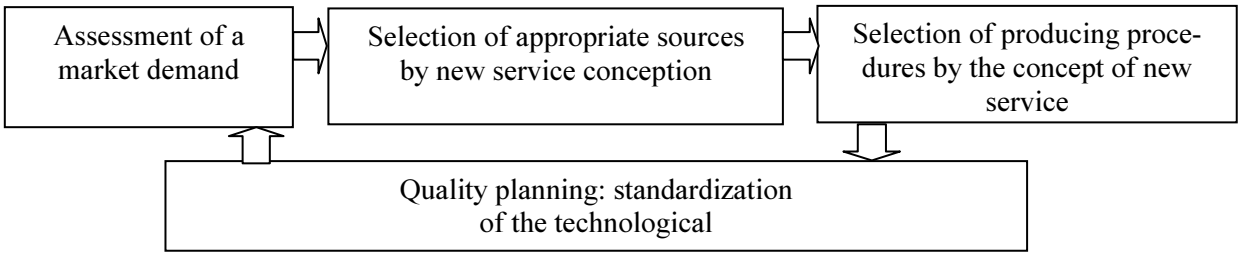

Fig. 1. Procedural model of new service technology creating

2) Selection of the means, which are necessary to achieve mentioned result;

3) The order determination of priority setting;

4) Foresight of the persons (or equipment), which are responsible for the implementation of the means.

Other authors provide the mentioned components as an individual and describe them in detailed form, but do not define them as technology planning process components (T. Heiskanen, H. Heiskanen 2011; Helkkula 2011 and etc.). According logic and systematic thinking it can be accepted mentioned C. Boshoff (1997), P. Trott (2005) proposal to distinguish technology planning stage of new product planning process, which consists of the above components. C. Boshoff (1997) and E. Venter *et al.* (2005) considered that the technological part of the project is appropriate to provide the required number of staff and allocation of responsibility is necessity also. Content of this offering worthy of attention, but this is more appropriate for the component of actions for procedures' standardization, which has to be determined in the set of actions.

3. Model of new service technology planning

According decisions assessment of processes for technology planning, which are presented in the previous sections, after summarizing opinions of other researches and capabilities of their use, concluded model can be proposed, which fully describes process of new service technology planning (Fig. 1).

The content of the model components will be reasoned and described in the further chapters of the article. Assessment of a market demand has to be permanent process; it is one the most important phases of the technology planning, and its using often leads to a new service success, allows to reduce production price and therefore it is provided first. The assessment results of a market demand determine term of technology use. Selected technology must be evaluated by customers and has to be improved or modified again and again according results of inquiry.

It is more chances to create long term technology only for leaders of service business (big companies), which can (have possibilities) dictate some service vogues. Such companies' relative

expenditure would be much lower. Long term service technology strategy can be useful for manufacturing companies, which purchasing services for its products serve. Small service companies, for example family companies, have to be more changeable in area of technology creating and be able more flexable to conform to market demands. Needs assessment include data and opinions from many different sources in order to make effective decisions (Persichitte, Bauer 1996).

The model shows the cyclic structure and order regular market needs assessment and the requirement to create new service by the assessment results. Companies that are not actively pursuing innovation are likely to lose in the competition. However, there is no single reason that encourages companies to innovate; each company has its own reason and motivation for innovating. Companies tend to put forth constant efforts to satisfy the needs of their customers, they are considered to be creating products that comply with their customers' preferences (Najib, Kiminami 2011).

The proposed model is universal, it is not against the neither the size nor specialization of any service business company. Application of the suggested model will allow service business to be more consistent in technology planning of new service and increase the likelihood of their success.

3.1. Assessment of a market demand

Understanding demand for new service or other innovations is a difficult and important task that has probably been overlooked by both economists and policy makers (Muscio *et al*. 2010; Drejeris *et al*. 2013). It follows that service innovations in the industry are hardly radical and more often of incremental nature. A. Muscio *et al.* (2010) identify three main typologies of demand for innovations (real, latent, potential) and argued, that it is necessary to measure not only customers demand, but employees demand for innovations also. Mentioned authors present taxonomy of that measuring and conclude that innovative processing technologies can meet the needs of several other industries also, so other industries can challenge demand of service innovations. It is commendable situation where increasing pressure for universities to raise research funding from industry and to contribute actively to industrial innovation. In a fast-changing environment leaders cannot predict what kinds of new service may be needed. Thus it is not clear what kind of new service structure and culture are needed for the customers, so that kind of analysis is necessary (Wood 2007). Determination demand of new service is one of the most important stages and it is necessary with ideas generation as a first step of new service development process. The success of any business depends on its ability to anticipate and respond effectively to consumer trends. Customer preferences and demand for the services and products offered by a service providing organisation may change due to changes in social trends, changes in travel, vacation or leisure activity patterns, weather, taxation, changing demographics etc. According S. Bharwani and D. Mathews (2012) inability on part of a business organisation to predict or react to such changes could result in reduced demand and erosion of its competitive and financial position.

Conformity assessment results of new service technology to market requirements reduce probability of failure. Implemented new services technology must meet the following basic requirements of the market (Mattila1999):

1) Price → min;

2) Quality → max;

3) Use of innovations in the delivery and the production making process → max.

While some of the above requirements are contrary, but companies still need to find optimal solutions, which would allow at least partially satisfy these requirements of the company and of the market. Both a technology of existing service, both new (planned) service technology have conformity with the requirements of the market and must be monitored continuously, because results only of continuous monitoring will be sensitive to market changes and adapt to the new demand and make it easier to achieve the desired results of the company. These results will help to decide on a new service technology planning direction, i.e., on the concept of the content, which will also be the basis for further decisions (Gofman *et al.* 2010).

Satisfaction of the market demand is normally carried out the treatment questionnaire-based surveys.

More objective decisions usually help properly performed data correlation and regression analysis, although solutions sometimes are enough to take oral consumer surveys. Service companies that do not have capacity to carry out such studies on their own, it is advisable apply to business consulting firms, whose activity is market research, innovations research, ideas generation. Market demand study can describe not only the new service concept, which it is appropriate to continue development of new services (or product) technology, but in general innovation purposefulness (Ruskin-Brown 2005; Moskowitz *et al*. 2006).

3.2. Appropriate sources selection by new service conception

Selection of raw materials should be guided by a new service concept, which has to be determined during assessment of consumer needs. Concept of new service is an idea, concretized at least several quantitative or qualitative parameters (Drejeris, Zinkevičiūtė 2009; Moskowitz *et al.* 2006). Character of the concept is usually determined by available in its ability to use (and get) certain raw materials and possession certain technological equipment and its capabilities. Thus, the planning model processes required for feasibility study. For the process selection of raw materials during creation of new technology is appropriate to find answers to the following questions (Drejeris 2011; Kirchhoff *et al.* 2011):

1. How effective will be utilized resources? In answering this question it is necessary to evaluate equipment options for treating certain products, possible treatment results of the evaluation of the loss amounts and type of waste reduction opportunities.
2. What price of the service can be as a result of technological change? Answers to this question has to be associated with the purchasing power of population trends survey results, forecasts of economic development, determination of raw materials used, the amount of the receipt expenditure, which sometimes can be the most important condition to choose.
3. What are the plans of competitors for the new or similar technology use opportunities? The answer to this question will also provide new service prices policy and will help to make some operational solutions.

These responses accurately can be known of the staff, which immediately into contact with visitors. Analysis of the results the above answers will determine, which is a raw material is the best choice to produce new service for some contingent of visitors and on their basis to evaluate the company's capabilities to improve performance.

Instead, value is derived from an outcome of a process in which customers integrate and use available resources, including their own knowledge, skills and motivations (Lusch et al. 2010).

Thus, service providers need to design resource constellations and service systems that support customers and include their resources in value co-creation (Vargo *et al.* 2008). These resource constellations comprise both tangible (operand) resources such as physical products, web sites or machines and intangible (operant) resources such as customers' knowledge and skills.

4. Selection of service procedures by the concept of new service

The optimal kind of production may also be lead to the results of concept evaluation (Drejeris, Zinkevičiūtė 2009) or kind of processing can be outlined and have a new service ideas (Moskowitz *et al*. 2006). Harder choose the most appropriate kind of service procedures, when a new service (technology) is created by power of the company employees. Selection of best food production procedures is associated with performance of large-scale experiments. Quite difficult to determine the best new baking degree, boiling down loss or match the ingredients and taste characteristics of these data to regulate the recipe in catering business. A lot of experiments are necessary for the selection procedures of creating other new service also. New service components compatibility is responsible decision, which can be made by creator with greatest experience and which must be based on the results of users' needs assessment and equipments facility. At first need to determine result of new service and then recognize the steps (actions) by which such result can be achieved (Boshoff 1997; Venter *et al*. 2005). It means that process of achieving final results of service has to be divided into smaller actions. Business companies, which dictate service fashions, create totally new and sometimes unexpected decisions. They also can use already known technologies and adapt them to other service processing and get unexpected results. However, all decisions must satisfy the users demand. By the way, not only the compatibility of the actions, but also assessment of country traditions is also required in this case (Beer, Lemmer 2011). According logic and systematically approach the next necessary stage for implementation technological actions is the selection of required equipment and to make analysis of the feasibility mentioned options. Aboth these actions are quite responsible and their appropriate execution can influence to results of new service success.

4.1. Selection of equipment for new service

During process of planning new service technology it is necessary to decide what equipment will be used for the intended operations: specialized or general? How many machines should replace humans in the process of control and producing? (Stoner *et al*. 2006). Selection of equipment depends on expected sales volume also. Other factors can have an impact on selection of the equipment and all the technology. In some cases, it may be infrastructural constraints (required electric power

P_1 lines lying on, access restrictions and so on.). Certain equipment must be provided for each technological procedure (Stoner *et al*. 2006).

Each group equipment selection must be acquired in accordance with established procedures, which are individual and depend on the complexity of the service providing process. So, in order to successfully deployment and use new technologies, it is important proper selection of the right equipment capacity. In order to solve this problem is appropriate to analyze and forecast the market demand fluctuations also. Company equipment capacity should be based on the results of market research and forecast of competitors' actions. Different equipment need for self-service providing, for individual service, for group service, services supported by an invitation at home environment and in services enterprises.

4.2. Feasibility assessment of new service technological procedures

Feasibility of procedures in service making process associated with the ensuring of stability in order to minimize scattering parameters of the whole operational performance and individual actions. Feasibility of some technological procedures of service business can be understood as assessment of any desired qualities emergence. This has to be decided upon in the selection of technological procedures and the selection of the required products. Feasibility of technological procedures could mean opportunities to use (or to get some materials or equipment). During planning new products and assessing technological feasibility of procedures important is the technical aspect, i.e. proper functioning of the equipment (reliability) and the staff's assessment of reliability.

One cannot deny the importance of staff characteristics in service business, especially when new service is making. Reliability of service providers can be assessed according to qualitative and quantitative criteria. For example, previous experience, a number of served customers and others. Feasibility of adequate funding, restrictions of technical compliance should be evaluated in terms of quantitative criteria. It is important to evaluate security of customers during the process of providing new service and technical its possibility also.

After solution about feasibility of new service a procedure providing it is necessary to determine theirs sequence.

4.3. Sequence of the new productes creating procedures

Procedural sequencing issue can be solved at the previous stage, i.e. during establishing the necessary actions. It is also possible noted that the operation of equipment or materials (raw materials) use features often leads to a process and suggest that targeted their progressively parallel procedures (Fig. 2). When parallel procedures are used, potential mergers will continue, if for any reason be impossible some procedure.

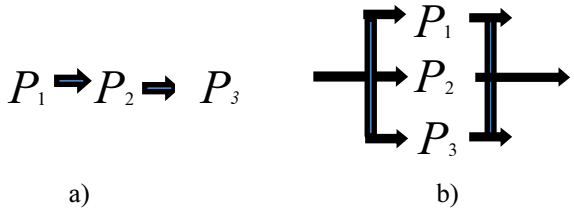

Fig. 2. The sequential (a) and parallel (b) procedures ***P***

Sequential procedures combination (Fig. 2.) is preferable for unlimited time technologies. The sequence of procedures for new service process has to be determined using appropriate reticular planning. Reticular planning is very in truth appropriate, that it allows provide not only consistent, but also the parallel execution of several actions, which is more reliable, in addition to reticular process plan will be the basis for determining procedures time, and other resources to identify and design the appropriate technology. It can be further specify that the network planning is a key element in reticular schedule and confirm that the reticular schedule helps to solve a variety of planning questions, this versatile method for not only a time planning, but also for resources and processes prediction.

5. Quality planning and procedures standardization

Service providing process, with its characteristics, needs particular management methods. There is a direct contact with a customer, and a service product must be provided well at the first time, and there is no space to failures. A service organization must be prepared very well to provide excellent service. Thus managers want methods for organization's ability assessment, the ability to provide excellent services (Urban 2009). Quality of the service can be defined according to V. A. Zeithaml and M. J. Bitner (2005) approach, which presented a number of scientists, and states that quality of the service, defines the degree of customer satis-

faction. When new service quality is planning, it is necessary to evaluate the influence of various factors. It meants, that service providing system must be created. Service system describes how customers, employees, equipments and other actors become effective and efficient resource integrators in value co-creation (Edvardsson *et al*. 2011). Therefore, new service quality planning has to include preparing of standards for making procedures. J. M. Aguileira (2009) and K. Karakasidis (1997) even categorical advocates for need of procedures standardization. They argues that standardization need for procedures, which carry out more than one person. By the way, K. Karakasidis (1997) emphasizes that the standardized parameters necessary to have even in written form, approved by head of the company. Though vastly underappreciated, standardized work, which provides clear benchmarks that employees are expected to meet in all of their responsibilities, is the most effective means of uniformly producing products and delivering services at the lowest cost and highest quality. In addition, standardized work is advantageous to workers themselves. If chosen with care and concern for employees, standards ensure that each task in the workplace is achievable and sustainable as well as safe, from both a risk and an ergonomic point of view. In other words, standardized work is a precursor to excellence, a catalyst for worker satisfaction, and a critical steppingstone for continuous improvement. Using a seven-step framework that we call the "standard work wheel," companies can implement standardization in the workplace for all types of employees and in all industries (Grichin *et al*. 2012).

V. A. Zeithaml and M. J. Bitner (2005) note that the limits of standards may be in different ranges, which will vary from nature of the activity. Low standards of quality planning (for example, lack of clear standards and regulations, setting too low or too high actions and liability limits of tolerance and so on.) causes problems for both new service providers and service staff also. Mentioned authors argue that standards are drawn not at the company, but by users.

After summarizing the many results and opinions of researchers and after adapting to the service business, it can be said that is appropriate to identify these new service standards, which have to be created and concretized for new technology:

1) Raw materials;
2) Providing time;
3) Workplace (procedures, equipment).

Such standards make a basis of new service. Pursuance of determined standards for new service gets the right quality.

5.1. Standardization of procedures duration and their sequence

Some researches duration of the procedure offer to determinate by the services providers, i.e. by companies' strengths or invite competent professionals. R. Drejeris (2011) proposes formulas for calculation of procedures duration T_v:

$$T_v = \frac{t_{\min} + 4t_{i.t.} + t_{\max}}{6}$$

or

$$T_v = \frac{3t_{\min} + 2t_{\max}}{5}, \qquad (1,2)$$

where:

$t_{\min}$ – minimum processing duration of the procedures,

$t_{\max}$ – maximum processing duration of procedures,

$t_{i.t.}$ – the most likely time of processing duration.

For example, determination of following parameters has to be made experimentally, after evaluating the results of the quality satisfaction. After determination the sequence of procedures, it is appropriative to determine time processing procedures for starting and ending moments, i.e. the length of time, which will take for whole process. It must be emphasized that the determination standards in service business is especially relevant in cases, when the visitors participate in the process of service. J. P. Chen *et al.* (2001) is particularly categorical in services standardization. They argue that standardization of the duration is the most important indicator of the quality.

5.2. Standardization of the work places for new service providing

According K. Grichnik *et al.* (2012) there are also ostensible cultural reasons for neglecting the importance of standardization in manufacturing companies. They state that in Western companies, standardization is often mistaken for introducing a Big Brother mentality to the organization, turning employees into boring, dull automatons. In fact, just the opposite is true. Standardization allows workers to leverage their creativity and entrepreneurship by giving them a benchmark against which to measure their own ideas for improvement. It would be not different approach in service business.

Work places are needed for certain technological operations accomplish of preparing new ser-

vice. Propriety of work places and equipment use influences not only employee work intensity, security, but it also affects the quality of the service (Drejeris *et al.* 2013). In the standards of the workplace should be included the requirements for resource use, responsibilities of the appropriate equipment operations also.

Quantities of resources required for new service providing can be determined by 3 ways:

1) According to the existing substances guidelines,

2) The method of analogy,

3) The experimental method.

Nowadays various working places use more sophisticated and modern equipment and devices, with changing not only their mode of action, but performance characteristics. The use of equipment related to the standardization of equipment regime values, norms, ensuring the most efficient their use, the determination and approval.

Resources for the preparation of service as the same may be varied in both quality and quantity depending on the technology. Companies need to constantly review the use of an equipment options in workplaces, the raw materials used in order to keep up with scientific-technical progress rates to market needs, since both the use of equipment and materials (raw materials) and the selection of appropriate content affect the quality of the new service. With starting of a new service is necessary not only to train new staff of working methods, but the allocation of responsibility for employees of the procedures quality, i.e. provide responsibility of standards observance.

6. Conclusions

1. The scientific and professional literature does not receive enough attention for problem of appropriate new productes technology development. The present analysis suggests that are conflicting opinions on the new products (productes) technology planning stages, even its number and content, most of the scientists suggest only partial elements of the limited process analysis.

2. Summarizing a wide range of scientific and professional works, after assessment in a logical and a systematic approach, new productes technology planning procedural model was developed, which enable an integrated assessment of the key factors that may influence planning decisions.

3. Suggested cyclical model consists of these major components: the market needs assessment, appropriate resources selection by new service-conception, selection of processing procedures by the concept of a new product, quality planning: standardization of the procedures. Sequence of the components is based on information, which is presented by various investigators after a logical assessment of their need and content.

4. Explicated courses of action at components of suggested model allows the appropriate assessment of the situation. Its using reduces the chance aspect and provides sufficient objective factors which may affect the new productes technology planning decisions.

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